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| 10/076,882 | 02/14/2002 | Michael Guttman | 11613.50USU1 | 1282 |
| 7590 Merchant & Gould P.C. P.O. Box 2903 Minneapolis, MN 55402-0903 | | | | |
| EXAMINER | | | | |
| MEHTA, PARIKHA SOLANKI | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/076,882

Applicant(s)

GUTTMAN ET AL.

Examiner

PARIKHA S. MEHTA

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-19 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 14 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-8508)
4) ☐ Interview Summary (PTO-413)
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____
Paper No(s)/Mail Date _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claims 3 and 13 are objected to because of the following informalities: claims 3 and 13 recite the step of "rendng" where "rendering" should be used. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 5, 7-13 and 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Boernert et al (US Patent No. 6,317,619 B1), hereinafter Boernert ('619).

Regarding claims 1-3, 7 and 19, Boernert ('619) discloses an apparatus (Fig. 2) and method (Fig. 4) for real-time 3D MR image reconstruction, including means and steps for collecting MR image data, transferring the data to a computer, producing and displaying a volume rendering from the MR data in real time with respect to the act of collecting the MR data. Boernert ('619) collects, transfers and renders the volume data continuously from a plurality of two-dimensional image slices (col. 16 lines 5-8).

Regarding claims 5 and 10, the complete dataset of Boernert ('619) (Fig. 54 step 56) constitutes a rectilinear slab as claimed.

Regarding claims 11 and 12, Boernert ('619) completes the 3D rendering after data for the entire slab has been reconstructed (Fig. 4 step 57).

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Regarding claim 13, the real-time rendering of Boernert ('619) constitutes performing the rendering with a delay of between collecting the MR data and displaying the 3D volume rendering is equal to or less than about one third of a second as claimed.

Regarding claim 17, the displaying of a partial view of Boernert ('619) (Fig. 4) constitutes determining the position of a cut plane through the volume and displays image data on only one side of the cut plane as claimed.

Regarding claim 18, Boernert ('619) organizes the MR data into image planes orthogonal to the view of the volume rendering displayed on the monitor (col. 15 line 57-col. 16 line 1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boernert ('619) in view of NessAiver (US Patent No. 5,329,925), hereinafter NessAiver ('925).

Boernert ('619) teaches all features of the present invention as previously discussed for claim 1, with the exception of express disclosure of steps for view sharing between even and odd echoes as claimed. In the same field of endeavor of magnetic resonance imaging, NessAiver ('925) teaches that it is known in the art to perform view sharing between even and odd echoes in order to combat DC artifacts (col. 2 lines 24-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Boernert ('619) to perform view sharing between even and odd echoes, in view of the teachings of NessAiver ('925).

7. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boernert ('619) in view of Pfister (Architectures for real-time volume rendering. Future Generation Computer Systems. 15:pp. 1-9. 1999), previously made of record, hereinafter Pfister (1999).

Boernert ('619) teaches all features of the present invention as previously discussed for claim 1, but does not expressly address the display frame rate nor steps for alpha blending. In the same field of

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endeavor, Pfister (1999) teaches steps for alpha blending (p. 3 col. 2) and also teaches that it is known in the art to provide real-time frame rates of approximately 10-30 fps (p. 2 col. 1), which constitutes a rate of "about 10 or more frames per second" as claimed. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of invention to perform the rendering method of Boernert ('619) by displaying the volume at 10-30 fps, and to employ state of the art alpha blending methods, as the combination of known prior art elements or steps to yield predictable results has previously been held as unpatentable over the prior art (see for precedent *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385).

8. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boernert ('619) in view of Deering (US Patent No. 6,417,861), hereinafter Deering ('861).

Boernert ('619) substantially teaches all features of the present invention, but does not expressly discuss displaying the volume rendering by alpha blending and/or maximum intensity projection (MIP) techniques. In the same field of endeavor of computer graphics, Deering ('861) teaches that alpha blending is known in the art to be advantageous for increasing the realism of computer images (col. 2 lines 25-28). Deering ('861) also teaches steps for MIP mapping (col. 29 lines 32-56), and teaches that MIP mapping is also advantageous for improving the realism of reconstructed images (col. 28 lines 38-43). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Boernert ('619) to employ the alpha blending and MIP techniques taught by Deering ('861) to render the 3D images, in view of the teachings of Deering ('861).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARIKHA S. MEHTA whose telephone number is (571)272-3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian L Casler/
Supervisory Patent Examiner,
Art Unit 3737

/Parikha S Mehta/
Examiner, Art Unit 3737